# SECTION D
# DETAILED EQUIPMENT SPECIFICATIONS

## 01. One each Wenger Model 30G53-2 Modular Design Horizontal Dryer:

- Sizing:
  - Two pass dryer.
  - One pass cooler.
  - Each dryer pass with five 2.1 m (7.0 foot) long sections of dryer for a total drying area of 65 square meters (700 square feet).
  - Three sections of attached external cooler for a total cooling area of 19.5 square meters (210 square feet).
  - Modular construction – capacity may be increased by adding sections.
  - TrueTemp® design where each pass has airflow independent of other passes. Each pass is divided lengthwise into two separate temperature and airflow zones, for a total of three independent temperature and airflow zones.
  - Floor between passes to separate air flows.
- Construction:
  - Maximum temperature of insulated enclosure is 175 °C (350 °F).
  - Housing in form of welded mild steel tubular frame with insulated, mild steel panels. All side panels where practical will be doors which can be opened for cleaning inside of unit.
  - Housing built in 2.1 m (7-foot) sections and designed for containerization:
    - Insulation is high temperature fiberglass.
    - Top insulation is 75 mm (3 inch), doors are 62 mm (2.5 inch), floors and end section sides are 50 mm (2 inch).
  - Stainless steel in following high-corrosion areas:
    - Interior of return section.
    - Ceiling above product.
    - Dryer external side door interiors.
    - Floor below conveyors.
    - Flashing and airlock curtains.
  - Support stand:
    - Furnished with a final product discharge height of 36 inches
  - All assembly fasteners, shafts and bearings to be metric.
- Product Spreader:
  - Oscillating spout spreader to spread product across width of conveyor.

- Spout is stainless steel construction.
- Welded tubular frame.
- Driven by 0.55 kW (0.75 hp) motor.
- Spout speed controlled by variable frequency drive.
- On-line stroke adjustment and on-line dwell adjustment.

- Product Conveyors:
  - Special high temperature PPS mesh screen carried on support frame. (Maximum temperature 177° C (350° F)).
  - Special Nomex product isolation seal 6 mm (0.25 inch) between conveyor side plates and flashing.
  - Top pass driven by 2.2 kW (3.0 hp) and bottom pass driven by 2.2 kW (3.0 hp) motors.
  - Conveyor speed of all passes controlled by variable frequency drives (sensorless vector control).(furnished by client)
  - Product conveyors shear pin protected.
- Fans and Ducting:
  - Dryer Air Recirculation:
    - Dryer recirculation of air for efficiency.
    - Two plug style recirculating fans for each dryer section driven by 7.5 kW (10.0 hp) motors.
    - Fan speed controlled by variable frequency drive (furnished by client).
    - Airflow can be directed in an up or down configuration to both top and bottom beds in each dryer section. Initial configuration is airflow through product alternates up and down by pass with top pass being up.
    - Each section includes manual dampers for controlling relative quantity of fresh air to each section and exhaust air from each section.
  - Dryer Air Exhaust:
    - Dryer exhaust fan with 45 kW (60 hp) motor.
  - Cooler Air Exhaust:
    - Air flow through cooler is down.
    - Cooler fan with 45 kW (60 hp) motor.
    - Fan speed controlled by variable frequency drive.(furnished by client)
  - Client to supply external exhaust ducting and cyclone dust collectors, using design parameters specified by Wenger:
    - Exhaust fans are clockwise rotation top horizontal discharge design, designed for outside installation, and includes rain hood, bird screen and manual dampers.
    - Dryer exhaust fans are designed for a maximum design static pressure drop in ducting and cyclone of 255 mm (10 inches) water column.

    - Cooler exhaust fans are designed for a maximum design static pressure drop in ducting and cyclone of 255 mm (10 inches) water column.
- Fines System:
    - Fines wipers attached to bottom conveyor for wiping bottom floor of dryer. Wipers are stainless steel, flat wire design.
    - Additional fines wipers are included for wiping sub floor.
    - Fines deposited in two cross augers, which are driven by 0.25 kW (0.33 hp) motors.
    - Two fines augers for recovering fines from side air plenums, driven by 0.25 kW (0.33 hp) motors. Stainless steel construction of all sheet metal components.
    - Fines augers are connected to provide one common discharge point.
- Heating System:
    - Gas burner equipment with one burner per section:
        - Combustion air blower with 0.37 kW (0.50 hp) motor.
    - One temperature controller per temperature zone.
    - Combustion safeguard system to meet FM requirements is furnished, mounted in control panel.
    - Gas train enclosures are IP52 (NEMA 12) (dust tight).
    - All necessary plumbing items are furnished pre-assembled, with interconnection piping between sections, and pre-wired to junction boxes.
    - Client to furnish interconnection wiring between sections.
- Control Panel:
    - IP65 (NEMA 4) (water tight) mild steel enclosure.
    - Emergency stop pushbutton.
    - Alarm horn and beacon.
    - Graphic process flow legend.
    - Digital indicators.
    - Start/stop push buttons and pilot light for each motor in system.
    - Discrete PID temperature controller for each temperature zone.
    - Motor starters are not included in this item. No three-phase wiring included.
    - Client to provide interconnection wiring and fittings between control panel and other equipment.
- Factory Assembly and Shipping Procedures:
    - Equipment will be completely assembled in factory and tested to extent possible.
    - Equipment will be disassembled only enough for shipping by open truck with oversize load permits.
- Installation: Client will be required to do following: (Depending on amount of disassembly required for shipping method used, some may already be done.)
    - Bolt together support stand and frame section pieces.

- Mount recirculation fans.
- Reassemble conveyor chain and components.
- Mount exhaust fans, gas train package and control panel.
- Reconnect piping between sections.
- Provide interconnection wiring between sections and to control panel and motor control center. No 3-phase wiring is provided.
- Install all items not furnished by Wenger.
- Optional technical service installation supervision available at regular service rates described below.

## 02. One each Add-On for Wenger Automated Process Management (APM) System for Computer Control of Dryer/Cooler:

- Automated Process Management (APM) System for Computer Control of Dryer/Cooler:
  - Human-Machine-Interface (HMI):
    - 915 mm (36 inch) wide x 1118 mm (44 inch) tall x 940 mm (37 inch) deep mild steel operator console enclosure.
    - Workstation computer including hard disc drive, backup system, communications module and un-interruptible power supply.
    - 482 mm (19-inch) flat panel color touch screen monitor.
    - Sealed keyboard with integral pointing device.
    - Emergency stop pushbutton.
    - Alarm horn and beacon.
    - Wenger software package:
      - Microsoft Windows.
      - Rockwell Software RSView32 Runtime.
      - RSLogix 5000 PLC programming software.
      - Wenger application program:
        - Graphic display of equipment controlled including device status and processing conditions.
        - Capability of storing up to 10,000 formulas.
        - Enhanced alarm handling including historical alarm retrieval.
        - Scheduled maintenance reminders for dryer.
        - Real time and historical process trending.
        - Data logging of process parameters to hard disc.
  - Allen-Bradley ControlLogix programmable controller system with Ethernet communications:
    - IP65 (NEMA 4) (water tight) mild steel enclosure.
    - Control program to control:

        - Motor start/stop interlock logic.
        - Temperature of each temperature zone.
        - Dryer and/or cooler retention time.
        - Speed of all VFD controlled motors.
        - Motor start/stop and VFD speed control via Ethernet I/P communication to Allen-Bradley intellicenter.
      - Mounting rack with power supply.
      - I/O blocks necessary to interface with equipment.
    - Remote access via client supplied high speed internet connection.
    - Motor starters are not included in this item. No three-phase wiring included.
    - Client to provide interconnection wiring and fittings between control panel and other equipment.
    - HMI console must be installed in an air-conditioned room with air temperature not to exceed 27 °C (80 °F) and relative humidity not to exceed 50% RH.
- Wenger Energy Control System:
  - Requires:
    - Requires dryer have a full APM or APM Basic Control System (either its own or added to extruder APM).
  - Operator Interface:
    - Added to dryer APM control system.
  - Energy Control:
    - Dew cell to measure temperature and humidity of exhaust air.
    - Intended to maximize dryer energy efficiency by controlling exhaust humidity at desired values:
      - Exhaust volume is controlled to desired ASR (adiabatic saturation ratio). This allows minimum possible exhaust energy level without condensation in exhaust duct.
  - Dryer exhaust fan requires variable frequency drive.

## 03. One each Wenger Startup Service:

- Startup Service for Equipment Listed:
  - After equipment has been installed in plant, Wenger has available service technicians who can come to plant to start equipment, train operators and discuss maintenance of equipment with maintenance personnel. One Wenger technician will be required for mechanical equipment. One Wenger technician will be required for controls and electrical equipment.

This service is available for new equipment startups and for a maximum of 17 man days (two technicians including travel time for up to one trip for each technician). Client to provide a round trip airline ticket from Wenger service office to destination. Client to provide local transportation, meals, and lodging for service technicians while they are away from their normal

place of business. Should additional days or any future service trips be required for any reason, then Wenger will be obliged to invoice client at per day rate detailed in Section H for each additional day service technician's assistance is required, plus hotel bills, meals and transportation.